

Intraoperative frozen section and imprint cytology of breast lesions:

A comparative study

**Dr. Shrinivas Kale, Dr. Smita Mulay, Dr. Anil Vare, Dr. S.M Bindu,
Dr. Meera Mahajan, Dr. C.P. Bhale**

MGM Medical College and Hospital,

Dept. Of Pathology, Aurangabad.

Abstract: To evaluate usefulness of intraoperative frozen section for various breast lesions and to compare its diagnostic yield with that of imprint cytology and paraffin sections.

role in assessing surgical margins and to interpret sentinel lymph node metastasis.

I. INTRODUCTION

Breast cancer is a worldwide oncological health problem and the leading cause of women mortality and morbidity. Frozen section (FS) is a vital technique used in diagnosis of breast lesions in agreement with imprint cytology (IC). It helps surgeons to take an immediate therapeutic decision, possibly sparing the patient a second operation and reducing hospitalization cost. Various studies have documented imprint cytology as reliable technique due to low percentage of false positive diagnosis.² Frozen section in association with imprint cytology has high degree of accuracy (varying from 94-98 %)³. Achieving negative surgical margins is critical to minimize the risk of tumor recurrence in patients undergoing breast conservation surgery for a breast malignancy.⁵ Intraoperative frozen section and imprint cytology has thus a vital

2. Materials and methods:

All surgically operated breast lesions submitted for intraoperative diagnosis to the histopathology and cytology department, MGM Medical College and Hospital, Aurangabad during a period of July 2014 to June 2016 are included in the study.

Approval was taken from ethical committee.

It was made mandatory to give call to histopathology department, 4 hours before starting a surgery so as to start cryostat and establish required temperature.

Considering risk of breakdown and other technical difficulties, another standby cryostat (YORCO) was made available.

Touch imprint cytology smears were made from cut surface of specimen submitted followed by staining with rapid PAP and subsequent frozen sections were made using YORCO Cryostat at the temperature between -20 to -25 C°.

- The frozen sections were stained immediately with rapid H & E.

- Remaining specimen was submitted for gold standard paraffin sections.
- Pathologist reporting imprint was blinded to frozen section and vice-versa.

3. Results:

No. of cases	Diagnosis on imprint	Diagnosis on frozen section	Final diagnosis on histopath
25	Fibroadenoma	Benign Lesion	Fibroadenoma
04	Benign Lesion	Benign Lesion	Phylloid tumor(benign)
04	Benign breast lesion(fibrocystic change)	Benign breast lesion	Fibrocystic disease
02	Reactive lymph node	Reactive lymph node	Reactive lymph node
12	Malignant	Carcinoma	IDC
01	Malignant	Carcinoma	Medullary carcinoma
01	Inconclusive	Inconclusive	Angiosarcoma
01	Benign	Benign	Paget's disease

Out of 50 samples submitted for intraoperative diagnosis, 15 were biopsy specimens, 10 were lumpectomy specimens, 23 were mastectomy specimens and 2 were axillary lymph nodes.

All the cases of benign breast lesions were diagnosed by both IC and FS; there was no false positivity.

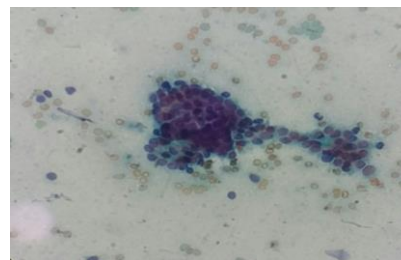
Out of 15 malignant lesions, 13 cases of IDC were diagnosed both by IC and FS.

2 cases showed discrepancies out of which first case of angiosarcoma on histopathology was missed by IC and FS due to large hemorrhagic areas.

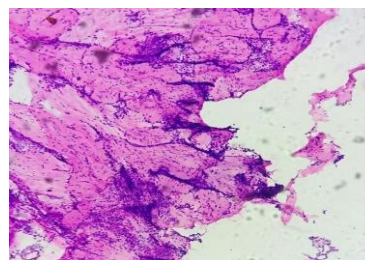
Another case of Paget's disease on histopathology was diagnosed as benign lesion both on IC and FS.

So these 2 were false negative cases.

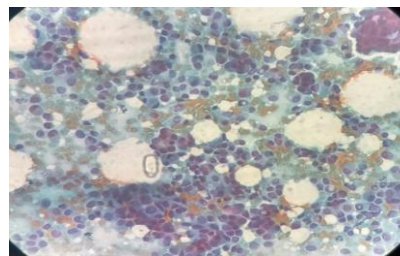
The data was analyzed using SPSS and it revealed sensitivity of 96% and specificity of 100% for both IC and FS



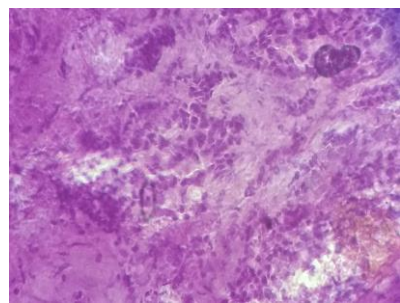
A) Imprint smear (400X) showing monomorphic clumps of epithelial cells



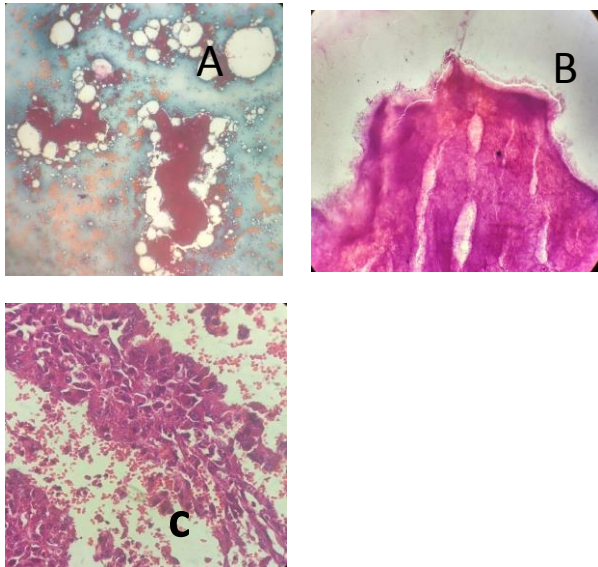
B) Frozen section (100X) showing benign stromal elements with few compressed ducts



A) Imprint smears (400X) showing round to polyhedral cells with pleomorphic nuclei and high N:C ratio .S/o IDC.

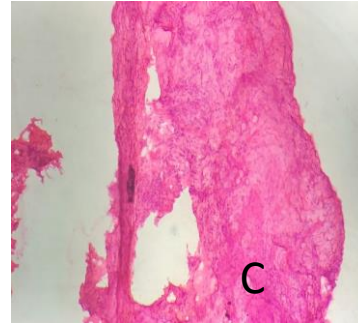


B) Frozen section(400X) showing round to polyhedral cells showing atypia and are distributed throughout the stroma; suggestive of malignancy

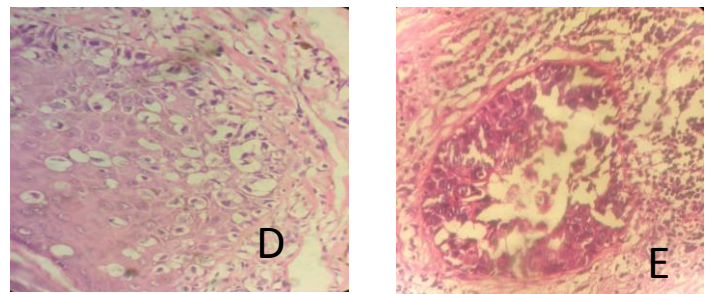


A) Imprint smear (400X) showing areas of hemorrhage only with few inflammatory infiltrate .B) Frozen sections (100X) also revealed stroma with hemorrhagic background with occasional inflammatory infiltrate, inconclusive for diagnosis. However C) histopathology (400X) of remanant tissue revealed tumor tissue and final diagnosis was angiosarcoma.

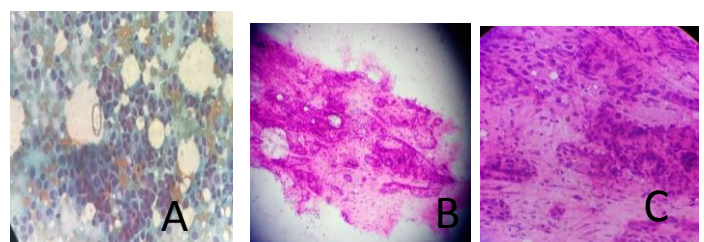
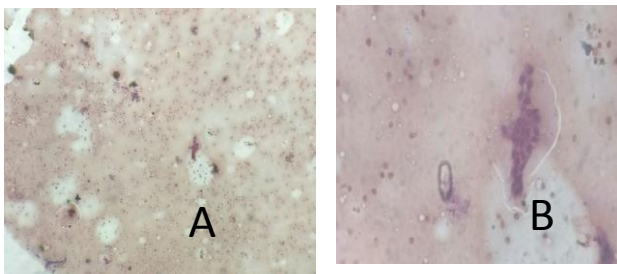
A&B) I mprint smears (100X and 400X respectively)showing few scattered clumps of epithelial cells and cyst macrophages with RBC's in the background; s/o benign lesion.

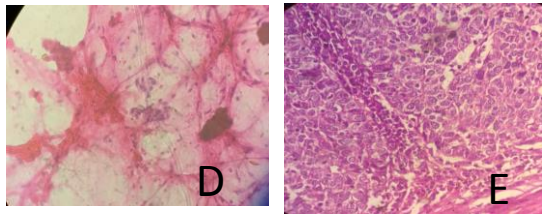


C) Frozen section (100X) of the same patient revealed few ductal and stromal elements ;at places epithelial elements .Features s/o benign lesion .However histopathological diagnosis was Pagets' disease with DCIS.



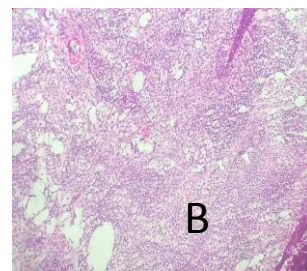
D&E) Paraffin sections showing evidence of Pagets' cells (400x) with DCIS respectively.



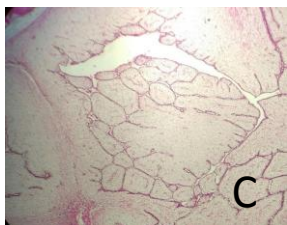
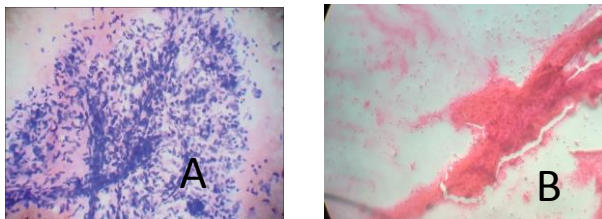


A) Imprint smears(400X) showing features s/o malignancy .B &C)(100X&400X resp.)Frozen sections revealing features suggestive of carcinoma. D) Frozen section (400X) showing resected margin positive for tumor infiltration. E) Paraffin section (400X) showing features suggestive of medullary carcinoma.

A) Imprint smear (400X) from axillary lymph node showing lymphocytes in varying stages of maturation s/o reactive lymph node



B) Frozen section(100X) of the same showing features of reactive lymph node



A) Imprint smear(100X) showing stromal hyperplasia with features suggestive of phyllodes tumor(benign) .B)Frozen section(400X) showing features consistent with benign phyllodes .C)Paraffin sections(100X) revealing features suggestive of benign phyllodes.

4. Discussion:

Imprint cytology and frozen section have gained popularity in assessing surgical margins and sentinel lymph node status¹.

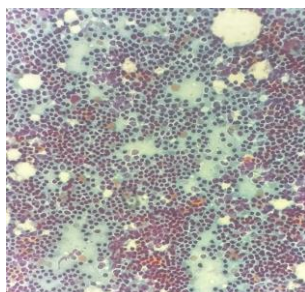
Our study found both IC and FS are valuable in assessing node status however FS has advantage over IC in assessing surgical margins.

Imprint cytology was first reported by Dudgeon and Patrick in 1927, but it recently achieved recognition as an adjunct to frozen section for intraoperative diagnosis.²

Ammar C.Al-Rikabi studied 80 cases and found that accuracy of frozen in adjunct to imprint cytology is 94%.³

Our study found accuracy of frozen in adjunct to imprint to be 96%.

-The two cases in this study having discrepancies were mainly because of two reasons:



1. Freezing and other artifacts produced by frozen section.

2. Large haemorrhagic background which was obscuring tumor cells which were missed on both IC and FS.

The cytological details provided by the intra-operative imprint smears are superior to those provided by frozen sections because of absence of freezing artifacts.

In addition, cryostat contamination can be avoided when potentially infectious specimens are diagnosed by intra-operative cytology.

Considering risks of technical breakdowns, it is necessary to always have standby cryostat; no such necessity for imprint smears. Imprint cytology is rapid, simple and inexpensive over frozen section.

However FS has better diagnostic utility in assessing resected margins over IC.⁵

5. Conclusion:

- Imprint cytology is cost effective, rapid as compared to frozen section.
- IC is as reliable as FS .
- FS has better diagnostic utility in assessing resected margins over IC.
- Frozen section is costly and has few disadvantages like freezing artefacts, limited sampling .
- Hence it is always better to use IC in association with FS.
- Imprint cytology can be considered as an alternative for FS where FS facilities are not available.
- However histopathology is still a gold standard

a)

2. Safina Ahmed, Comparision of diagnostic accuracy of touch imprint cytology and frozen section techniques in detecting breast malignancies,JPMA 66:292;2016.

3. Ammar C.Al-Rikabi Intra-operative cytology and frozen section of breast lesions: A comparision from a Saudi teaching hospital, Bahrain Medical Bulletin, Volume18,March 1996.

4. Sushma N Ramraje Imprint smear cytology and histopathology of breast lesions-A comparative evaluation with review of literature, Cibtech Journal of Bio-protocols ISSN: 2319-3840, December 2012.

5. Karla Esbona Intraoperative imprint cytology and frozen section pathology for margin assessment in breast conservation surgery: A systemic review ;Ann Surg Oncol.October2012.

6. S.Tripathy Utility of imprint cytology for intraoperative consultation,PP-294.

6. References:

1. Saritha Karre, Satyanarayana Importance of intraoperative-touch imprint cytology in the diagnosis of neoplastic lesions of breast ,Volume 14, Issue10, IOSR Journal of medical sciences, Oct.2015.